Chapter 5 · Arithmetic Progressions

Part 11 · The Escape Challenge

Five gates, each a calculation. Each gives you one digit. Collect all five to unlock the exit code.

🔒 GATE 1 — The Term Gate

Find the 10th term of the AP 2, 7, 12, …

Digit: ☐

🔒 GATE 2 — The Difference Gate

For the AP 10, 7, 4, …, find |d| (the common difference, ignoring sign).

Digit: ☐

🔒 GATE 3 — The Sum Gate

Find S_{10} for the AP with first term 1 and last term 19, if there are 10 terms in total: use $S_n = \frac{n}{2}(a + l)$.

Digit: ☐

🔒 GATE 4 — The Position Gate

Which term of the AP 3, 8, 13, 18, … is 78? (Answer: the term number.)

Digit: ☐

🔒 GATE 5 — The Formula-Count Gate

How many distinct boxed formulas for S_n appear in the Learn First section (counting the $2a + (n-1)d$ form and the $a + l$ form separately)?

Digit: ☐

EXIT CODE: ☐ ☐ ☐ ☐ ☐

One idea — add the same fixed number every time — builds an entire toolkit: a formula for any term, and a formula for any sum. Once you can find a and d from almost anything you are given, the rest is just careful substitution. □